

1/19/1 DIALOG(R) File 351:Derwent WPI (c) 2006 Thomson Derwent. All rts.  
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012855829 \*\*Image available\*\*  
WPI Acc No: 2000-027662/200003

XRPX Acc No: N00-020693

Hot gas defrost system of refrigeration equipment with oil and liquid refrigerant injection type compressor - opens liquid refrigerant injection pipe proportional to raise in discharge temperature while opening and closing hot gas defrost path respectively during defrost and normal operations

Patent Assignee: KOBE STEEL LTD (KOBM )

Number of Countries: 001 Number of Patents: 002

Patent Family:

Patent No	Kind	Date	Applicant No	Kind	Date	Week
JP 11294906	A	19991029	JP 98101136	A	19980413	200003 B
JP 3458058	B2	20031020	JP 98101136	A	19980413	200369

Priority Applications (No Type Date): JP 98101136 A 19980413

Patent Details:

Patent No	Kind	Lat	Pg	Main IPC	Filing Notes
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JP 11294906 A 4 F25B-047/02

JP 3458058 B2 4 F25B-047/02 Previous Publ. patent JP-11294906.

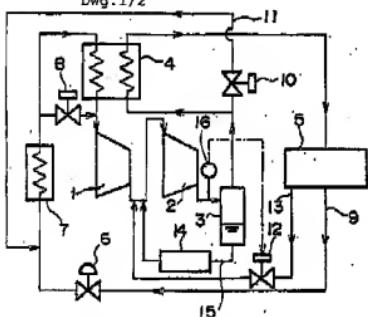
Abstract (Basic): JP 11294906 A

NOVELTY - The opening of a switching valve (12) in a liquid refrigerant injection pipe (13) is increased based on raise in discharge temperature detected by a temperature controller (16). The switching valves (8,10) of a suction path and a hot gas defrost path (11) are respectively opened and closed during a normal operation and closed and opened during defrost operation. DETAILED DESCRIPTION - A set of compressors (1,2), an oil separator (3), a thermal storage tank (4), a condenser (5), an expansion valve (6), an evaporator (7) and the suction path switching valve are sequentially connected by a main refrigerant circuit. The hot gas defrost circuit is branched from the oil separator and connected to the upstream of the evaporator and extended from the upstream of the suction path switching valve to have a heat exchange through the thermal storage tank and join the downstream of the suction path switching valve. The liquid refrigerant injection pipe is connected from the liquid pool of the condenser to the compression spaces of the compressors. An oil injection pipe (15) is connected from the oil pool of the oil separator to the oiling locations of the compressors through an oil cooler (14). The temperature controller is fixed at a part between the compressor and oil separator. The liquid refrigerant injection path is opened by a control signal output to the corresponding switching valve from the temperature controller, when the discharge temperature exceeds a predetermined set value.

USE - For performing hot gas defrost to the evaporator of a refrigeration equipment equipped with an oil injection type compressor.

ADVANTAGE - A raise of discharge temperature is suppressed since a liquid refrigerant injection path is opened proportional to the increase in discharge temperature according to the control signal from a controller when exceeding a predetermined set value of discharge temperature. The reduction of discharge pressure and raise of suction pressure is prevented during a hot gas defrost operation by supplying liquid refrigerant through the liquid refrigerant injection path. The raise of discharge temperature due to oil supply insufficiency can be prevented as a result. The generation of an emergency situation where the compressor stops can be eliminated. DESCRIPTION OF DRAWING(S) - The drawing is a diagram showing the entire composition of a refrigeration equipment equipped with oil and liquid refrigerant injection type compressors. (1,2) Compressors; (3) Oil separator; (4) Thermal storage tank; (5) Condenser; (6) Expansion valve; (7) Evaporator; (8,10) Switching valves; (9) Main refrigerant circuit; (11) Hot gas defrost path; (12) Liquid refrigerant injection path switching valve; (13) Liquid refrigerant injection pipe; (14) Oil cooler; (15) Oil injection

path: (16) Temperature controller.  
Dwg.1/2



Title Terms: HOT; GAS; DEFROST; SYSTEM; REFRIGERATE; EQUIPMENT; OIL; LIQUID; REFRIGERATE; INJECTION; TYPE; COMPRESSOR; OPEN; LIQUID; REFRIGERATE; INJECTION; PIPE; PROPORTION; RAISE; DISCHARGE; TEMPERATURE; OPEN; CLOSE; HOT; GAS; DEFROST; FAKE; RESPECTIVE; DEFROST; NORMAL; OPERATE

Derwent Class: Q75; X27

International Patent Class (Main): F25B-047/02

International Patent Class (Additional): F25B-001/00; F25B-001/10

File Segment: EPI; EngPI

Manual Codes (EPI/S-X): X27-F03

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Derwent Title: Vapor compression-type refrigerator uses expansion valve to reduce pressure of refrigerant flowing out from evaporator and guide it to compressor while passing refrigerant from compressor to evaporator along bypass path

Original Title: JP2004218855A2: VAPOR COMPRESSION TYPE REFRIGERATING MACHINE

Assignee: NIPPONDENSO CO LTD Standard company  
Other publications from NIPPONDENSO CO LTD (NPDE)...

Inventor: None

Accession/Update: 2004-04-02 / 2004053

IPC Code: F25B 47/02 ; F24F 11/02 ; F25B 1/00 ;

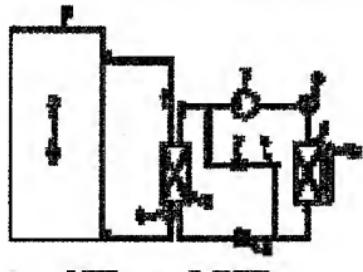
Derwent Classes: Q74; Q75; X22;

Manual Codes: X27-F02A(Refrigeration), X27-F02C1(Compreseors, electric motors, pump)

Derwent Abstract: (JP2004218855A2) Novelty - A bypass route (6) guides the high pressure refrigerant discharged from a compressor (1) to an evaporator (4) during defrosting of the evaporator. A expansion valve (5) reduces the pressure of the refrigerant flowing out of the evaporator and guides it to the inlet of the compressor, during defrosting operation. Use - Vapor compression-type refrigerator.

Advantage - The defrost operation is terminated in a short time since the hot gas discharged from the compressor is passed through the evaporator without pressure reduction. The evaporation time of the refrigerant in the evaporator for usual operation is lengthened and the refrigerator is operated efficiently.

Images:



Description of Drawing(s) - The figure shows a refrigerating cycle of the vapor compression-type refrigerator. (Drawing includes non-English language text). compressor 1, evaporator 4, expansion valve 5, bypass route 6, bypass valve 7 Dwg.1/4

Family: PDF Patent Pub. Date Derwent Update Pages Language IPC Code  
 JP2004218855A2 \* 2004-08-05 200453 9 English F25B 47/02  
Local appls.: .....

Priority Number:	Application Number	Filed	Original Title
	JP2003000003278	2003-01-09	VAPOR COMPRESSION TYPE REFRIGERATING MACHINE

Title Terms: VAPOUR COMPRESS TYPE REFRIGERATE EXPAND VALVE REDUCE PRESSURE  
REFRIGERATE FLOW EVAPORATION GUIDE COMPRESSOR PASS REFRIGERATE  
COMPRESSOR EVAPORATION PATH

**Refrigerator with defrosting and draining function - provides aperture mechanism between hot gas pipe and evaporator configured to defrosting circuit**

JP08218599A2: REFRIGERATING PLANT

MITSUBISHI ELECTRIC CORP Standard company  
Other publications from MITSUBISHI ELECTRIC CORP  
(MITQ)...

None

1996-445872 / 200359

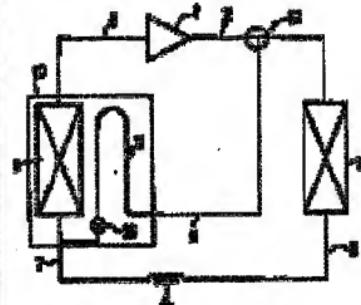
F26B 47/D2

075:X27:

## X27-F02C (Components)

(JP08219599A) The refrigerator includes a main coolant circuit consisting of a compressor (1), a condenser (3), and an opening aperture (4). A changeover valve (13) is provided between the compressor and the condenser. Condensed liquid, dropped from an evaporator (6) is accumulated in a drain pan (10). A hot gas pipe (11) and the evaporator configure a defrosting circuit (9) set in the drain pan using high-temp. coolant discharged by the compressor. Connected between the gas pipe and the evaporator is an aperture mechanism (16).

**Advantage -** Raises compressor input during defrosting drive; limits redn. in cyclic amt. of coolant. Maintains high temp. of drain pan. Prevents defrosting defect of drain pan and evaporator. Reduces cost of refrigerator since automatic regulating valve is not required. Shortens defrosting time since chances drain pan freezes during cooling operation is reduced. Smoothly discharges melt ice from drain pan by providing waste pipe.



Dwg-1/13



PDF Patent	Pub. Date	Derwent	Pages	Language	IPC Code
<input checked="" type="checkbox"/> JP08219599A *	1995-08-30	199645	7	English	F25B 47/02
Local appls.: JP1895000020463	Filed: 1995-02-08 (95JP-0020463)				
JP03415881B2 = 2003-08-23	200341	6	English	F25B 47/02	
Local appls.: Previous Publ. JP08219599 (JP 8219599)	JP1895000020463	Filed: 1995-02-08 (95JP-0020463)			

None

Application Number	Filed	Original Title
JP1895000020463	1995-02-08	REFRIGERATING PLANT

REFRIGERATE DEFROST DRAIN FUNCTION APERTURE MECHANISM HOT GAS PIPE EVAPORATION CONFIGURATION DEFROST CIRCUIT

Boolean | Accession Number | Advanced

Data copyright Thomson Derwent 2003

Operation control method for frozen refrigeration showcase - involves stopping drive operation of freezer when liquid bypass solenoid valve breaks down

JP08159620A2: OPERATION CONTROL METHOD OF REFRIGERATED AND CHILLED DISPLAY CASE

MITSUBISHI ELECTRIC CORP Standard company  
Other publications from MITSUBISHI ELECTRIC CORP (MITQ)...

NIPPON KENTETSU CO LTD Standard company  
Other publications from NIPPON KENTETSU CO LTD (NIKE)...

None

1996-344928 / 199535

F25B 47/02 ; F25D 11/00 ;

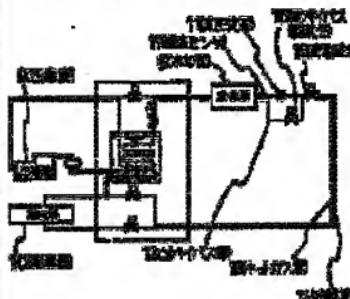
Q75: X27;

X27-F02A(Refrigeration) , X27-F03(Control)

(JP08159620A) The method involves forming a refrigerating cycle by sequentially connecting a compressor (9), a condenser (10), a pressure reducing device (11), a cooling device (8) and a coolant tube (14). The output terminal of the compressor and pressure reducing device are connected by a hot gas pipe (13) for defrosting.

A liquid bypass solenoid valve (15) is provided for the hot gas pipe by a freezer unit. The cool gas to drive the cooling device for defrost is provided by the freezer by opening the solenoid valve. The cooling device cools the hot gas from the compressor. The driving operation of the freezer is stopped when the solenoid valve breaks down and the state is displayed.

Advantage - Prevents liquid backing phenomenon generation and protects compression machine. Inform solenoid valve breakage to user.

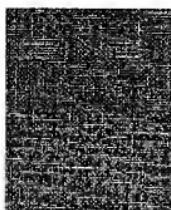


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PDF Patent Pub. Date Derwent Update Pages Language IPC Code  
JP08159620A \* 1996-05-21 199635 9 English F25B 47/02

Local appl.: JP1994000304500 Filed:1994-12-08 (94/P-0304500)

Application Number	Filed	Original Title
		OPERATION CONTROL METHOD OF



JP199400030460D	1994-12-08	REFRIGERATED AND CHILLED DISPLAY CASE
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OPERATE CONTROL METHOD FREEZE REFRIGERATE SHOWCASE STOP  
DRIVE OPERATE FREEZE LIQUID SOLENOID VALVE BREAK DOWN

Advanced	Boolean	Accession/Number	Advanced
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Data copyright Thomson Derwent 2003

Heat pump type air conditioner - has check valve that permits only coolant to flow on defrosting direction through couple of branch pipes

JP08121915A2: HEAT PUMP TYPE AIR CONDITIONER

MITSUBISHI JUKOGYO KK Standard company  
Other publications from MITSUBISHI JUKOGYO KK  
(MITSUBISHI JUKOGYO KK)

None

1996-290343 / 199630

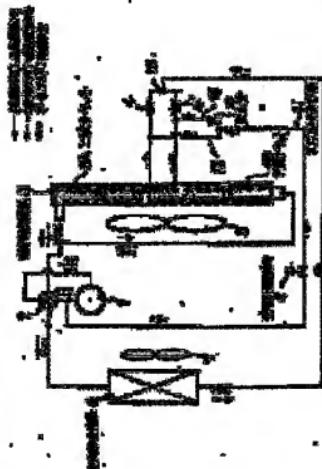
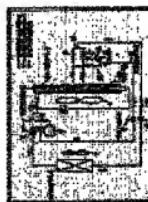
F25B 47/02 ;

Q7B:

(JP08121915A) The air conditioner has a defrosting circuit which directly introduces a portion of an exhalation gas from a compressor into each circuit of an outdoor heat exchanger (3). The portion of the exhalation gas is introduced through a defrosting by-pass pipe (11) and a couple of defrosting branch pipes (12,13) when defrosting.

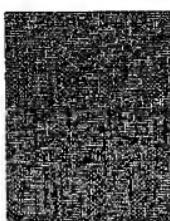
A coolant channel provides the outdoor heat exchanger divided into several shelves circuit, in an up-down direction. A check valve (10) permits only a coolant to flow on a defrosting direction through the branch pipes.

**Advantage** - Provides low drive frequency of compressor. Prevents crowding of liquid coolant in lower circuit.



Dwg.1/2

App. Patent	Pub. Date	Derwent Update	Pages	Language	IPC Code
JP08121915A * 1996-05-17	199630		4	English	F25B 47/02
Local appln.: JP1994000258031 Filed:1994-10-24 (94JP-0258031)					



Application Number	Filed	Original Title
JP1994000255031	1994-10-24	HEAT PUMP TYPE AIR CONDITIONER

HEAT PUMP TYPE AIR CONDITION CHECK VALVE PERMIT COOLANT  
FLOW DEFROST DIRECTION THROUGH COUPLE BRANCH PIPE

Patent Type	Patent Type	Accession Number	Advanced
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